STUDY ON THE EFFECTS OF THREE FISHING BAITS ON THE CATCH COMPOSITION OF MALIAN TRAPS IN LAKE KAINJI, NIGERIA

BY

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ABSTRACT

The studies on the effects of three fishing baits on the catch composition of Malian traps in Lake Kainji were investigated. The traps were set between Monai and Taada fishing villages in the Southern basin of the lake, baited with their respective treatment and were inspected daily for twelve days. A total of 218 fish were caught, of which the highest (54.59%) was caught by corn bran, while the lowest (11.01%) was caught by stomach content and rice bran caught 34.4%. The fish caught comprised of 15 species belonging to 8 families. There was no significant different (P>0.05) in the catch of the various baits. The weight also followed the same trend as the number of fish caught. However, both baits showed better efficiency for Alestes baremose, Tilapia zillii, S. galilaeus, Oreochromis niloticus, Labeo coubie and Distichodus rostratus than other species caught. There was a wide range between the minimum and maximum size of species caught, which showed the efficiency of the traps in capturing small size, juveniles and the adult of large fish species due to small mesh size (1") net- cover of the trap. Recommendations were made on the use of corn and rice bran as baits for enhancing catch efficiency for fishes such as O. niloticus, T. zillii, T. galilaeus and D. rostratus.

INTRODUCTION

Baits, lures or attraction devices are often incorporated into some fishing gears in order to improve their efficiency. Such fishing gears include handlines, longlines, trolling and traps. Baits may include rotten meat, dead fish, palm nuts or corn. Traps are selective for size at the lower size ranges but will capture any size upward that will pass through the entrance (Welcomme, 2001).

A good longline and trap has to be attractive to the targeted fish (not to others) either chemically or visually, able to induce the fish to ingest the bait, and be tenacious, remaining on the hook for the entire duration of fishing or until a fish is caught (Lokkeborg and Bjordal, 1992). The effectiveness of bait may be species-specific, and probably changes with the season and availability of natural prey species on the fishing grounds. Baits, lures and attraction devices used in the inland fisheries in many tropical countries were described in Welcomme (2001).

In Nigeria, various types of traditional fishing baits were widely used by artisanal fishermen. However, the literature available showed dearth of documented knowledge on these traditional fishing baits. The results of the study conducted by Jubril (2004) showed the various fishing baits used by the fishermen in Lake Kainji which include cooked corn bran, rice bran (in paste form), whole fish /chunk/stomach content, snail, termite hill, *Ipomea aquatica* leaves etc. However the relative effectiveness of these baits for trap fishing was not adequately documented. With this in mind, this study was carried out in order to

1. Determine the effects of three bait types on the catches of Malian trap in Lake Kainji, and

2. Make recommendation on the most efficient bait type(s) for trap fishing on the Lake.

MATERIALS AND METHODS

Study Location

The study was conducted between Monnai and Taada fishing villages of Lake Kainji. The lake description was well documented in Ibeun and Balogun (1995) and Adimula (2003)

Fishing Baits

The three types of baits used include; cooked corn bran, rice bran and stomach content of fish. The cooked corn bran was prepared locally, and allowed to cool and then cut into pieces or ball shapes so that water will not wash it away and will last for two or three days. Rice bran (Buntu) was prepared by adding small quantities of water, mixed and made it into ball shape. Stomach content of fish was usually collected or purchased from fish mongers after they had gutted the fresh fish bought from the fishermen in the landing sites.

Malian Trap

The Malian trap was constructed with available materials within the locality. These materials include *Mimosa Pigra* cane (stick), Mounting twine, 1" (25mm) meshsize netting, net needle and razor. A total of 26traps was used.

Experimental Design

The fishing experiment was designed in a Randomised Complete Design (RCD) with three replications.

Data collection and analysis

The data collected from the species of fish caught include; number, length (cm) and weight (g) of each fish caught using a measuring board and Electronic Weighing Scale model Ohaus LS2000 of 200g capacity. The fish species were identified using the monographs of Holden and Reed (1972) and Olaosebikan and Raji (1998). The data obtained was subjected to simple statistical analysis using percentages. Analysis of variance was carried out using Microsoft Excel computer programme.

RESULTS

Types and number of fish caught

Fifteen different species belonging to eight families were caught (Table 1). The three bait types caught six of these species. They include *Alestes baremose*, *Tilapia zillii*, *Sarotherodon galilaeus*, *Oreochromis niloticus*, *Labeo coubie* and *Distichodus rostratus*. Only *Clarotes laticeps* and *Clarias anguillaris* were caught by trap baited with corn bran, while *Tilapia aurea* was the only species caught by rice bran bait. *Synodontis eupterus* and *S. nigrita* were only caught by trap baited with stomach contents of fish. The common species caught by both traps baited with rice bran and stomach content includes *Chrysichthys nigrodigitatus* and *Alestes nurse*, while species common to both corn bran and rice bran were *Hemichromis fasciatus* and *Citharinus citharus*.

The number and percentages of fish caught in Malian trap baited with three different baits are shown on Table 2. The total number of fish caught was 218, of which the highest percentage 54.59% was recorded by trap baited with corn bran (Dussa) and least 11.01% was recorded by trap baited with stomach contents and rice bran as bait had 34.40%. The numbers of the different fish species caught in the Malian traps attributable to the different baits vary. Comparison of the overall numbers of fish caught using all baits shows that *O. niloticus* accounted for the largest percentage of 35.78%, followed by *D. rostratus* 15.14% and *T. zillii* 14.68% respectively.

Table 1: Types of fish caught in the baited Malian Trap set in Lake Kainji

Family	Species
Bagridae	*Chrysichthys nigrodigitatus*
	Clarotes laticeps
Characidae	**Alestes nurse**
	Alestes baremose
Cichlidae	*Hemichromis fasciatus*
	Tilapia zillii
	Sarotherodon galilaeus
	Oreochromis niloticus
	Tilapia aurea
Citharinidae	*Citharinus citharus*
Claridae	*Clarias anguillaris*
Cyprinidae	*Labeo coubie*
Distichodontidae	*Distichodus rostratus*
Mochokidae	*Synodontis nigrita*
	Synodontis eupterus

Table 2 Number and Percentages of Various Fish Species Caught in Malian Trap by Baits

	BAITS							
	Corn bran (Dussa)		Rice Bran		Stomach Content		Overall	Total
Fish species	No	%	No	%	No	%	No.	%
C. nigrodigitatus	-	-	1	1.33	2	8.33	3	1.38
C. laticeps	1	0.84	-	-	-	-	1	0.46
A. nurse	-	-	2	2.67	1	4.17	3	1.38
A. baremose	2	1.68	2	2.67	1	4.17	5	2.29
H. fasciatus	1	0.84	5	6.67	-	-	6	2.75
T. zillii	13	10.92	14	18.67	5	20.83	32	14.68
S. galilaeus	19	15.97	8	10.67	1	4.17	28	12.84
O. niloticus	52	43.69	24	32.0	2	8.33	78	35.78
T. aurea	-	-	1	1.33	-	-	1	0.46
C. citharus	5	4.20	5	6.67	-	-	10	4.59
C. anguillaris	1	0.84	-	-	-	-	1	0.46
L. coubie	4	3.36	5	6.67	6	25.0	15	6.88
D. rostratus	21	17.65	8	10.67	4	16.67	33	15.14
S. nigrita	-	-	-		1	4.17	1	0.46
S. eupterus	-	-	-		1	4.17	1	0.46
TOTAL	119	100	75	100	24	100	218	100
Relative percentage	54.59		34.40		11.01			

However, the dominant fishes in the catches of the traps using the three baits, were *O. niloticus* that accounted for 43.69% baited with corn bran. Ranked next to this fish were *D. rostratus* 17.65%, *S. galilaeus* 15.97% and *T. zillii* 10.92%, baited using the corn bran (Dussa). Using rice bran (Buntu) as bait, the dominant fishes in the catches of the trap were *O. niloticus* (32%), *T. zilli* (18.69%). *S. galilaeus* and *D. rostratus* had 10.67% each, while *L. coubie* and *H. fasciatus* species each had 6.67% respectively. Where stomach contents of fish were used as

bait, the dominant species caught were *L. coubie* (25%), *T. zillii* (20.83%), *D. rostratus* (16.67%) and *C. nigrodigitatus* and *O. niloticus* had 8.33% each.

Biomass of fish caught

The weights of fishes caught by baited Malian traps were presented in Table 3. *O. niloticus*, *S. galilaeus*, *D. rostratus* and *T. zillii* accounted for 34.16%, 14.24%, 13.89% and 11.48% of the weights of all the fish caught baited with the three baits, respectively. When the corn bran (Dussa) used as bait, *O. niloticus*, *T. zillii*, *C. citharus*, *S. galilaeus* and *L. coubie* accounted for the largest proportions 38.05, 13.16, 12.61, 10.95 and 10.05%, respectively. The weights of fish baited with stomach contents of fish was 1.04kg, of which *L. coubie*, *T. zillii* and *D. rostratus* contributed 33.34, 26.96 and 11.79% while the rest of the species accounted for 29.91%. Analysis of variance of the biomass of fish caught showed that the mean weights of *O. niloticus*, *D. rostratus* and *S. galilaeus* were significantly different ($P<0.05$). While there were not significantly different ($P>0.05$) in the biomass of *T. zillii*, *L. coubie* and *A. baremose*

Table 3: Biomass of Fish Caught in Malian Trap by Baits.

	BAITS							
	Corn bran (Dussa)		Rice Bran		Stomach Content		Overall	Total
Fish species	Wt (g)	%	Wt (g)	%	Wt (g)	%	Wt (g)	%
C. nigrodigitatus	-	-	47.6	1.74	48.2	4.65	95.8	1.11
C laticeps	21.1	0.43	-	-	-	-	21.1	0.24
Alestes nurse	-	-	55 6	2 03	25.6	2.47	81.2	0 94
A. baremose	54.2	1 11	57 3	2.09	29.9	2.88	141.4	1.63
H. fasciatus	32.5	0.66	64.4	2 35	-	-	96.9	1.12
T. zillii	354.6	7 25	360.9	13.16	279 6	26.96	995.1	11 48
S. galilaeus	923.1	18.88	300.1	10.95	11	1.06	1.234 2	14 24
O. niloticus	1,853.3	37.91	1.042.9	38.05	90.3	8 71	2.986.5	34.46
T. aurea	-	-	13.3	0 49	-	-	13 3	0.15
C. citharus	450.1	9.21	345.6	12.61	-	-	795.7	9.18
C. anguillaris	97.9	2.00	-	-	-	-	97.9	1.13
L. coubie	196.9	4.03	276.6	10 09	345.7	33.34	819.2	9.45
D. rostratus	905.1	18.51	176.6	6.44	122.2	11.79	1,203.9	13.89
S. nigrita	-	-	-	-	14	1 35	14	0.16
S. eupterus	-	-	-	-	70.4	6.79	70.4	0.81
TOTAL	4,888.8	100	2,740.9	100	1,036.9	100	8,666.6	100
Relative Percentage		56.41		31.63		11.96		

Sizes of fish caught

The standard length (cm) and weight (g) of the different species caught was summarized in Table 4. The minimum standard length of fish caught ranged from 5.5cm of *T. zillii* to 14cm of *C. citharus*, and the maximum standard length also ranged from 11cm of *H. fasciatus* to 18.5cm of *Labeo coubie*.

The minimum weights were also those of the two species in the minimum standard length and ranged from 6.7g and 68.9g of *T. zillii* and *C. citharus* respectively. The maximum weights (g) ranged from 27.9g of *Alestes nurse* and 123.2g of *O. niloticus*.

The results of analysis of variance of the length by bait in *O. niloticus*, *D. rostratus* and *T. zillii* shows significant differences ($P<0.05$). However, the length of fish caught by bait in *T. zillii*, *L. coubie* and *A. baremose* revealed a no significant difference ($P>0.05$).

Table 4: Summary of Length and Weight of Fish Species Caught with Malian Traps baited with three Fishing Baits

Species	Standard length (cm) Minimum	Maximum	Weight (g) Minimum	Maximum
C. nigrodigitatus	9	13	16	47.6
A. nurse	10.5	11.5	25.6	27.9
A. baremose	10	11.5	24.7	32.6
H. fasciatus	6.5	11	11.5	32.5
T. zillii	5.5	15	6.7	114 4
S. galilaeus	6	14	7.2	104.5
O niloticus	6	14.5	8.7	123.2
C. citharus	14	17	68.9	105.7
L. coubie	13	18.5	41.9	100.1
D.rostratus	8.5	16	17.1	90.6

DISCUSSION

The fishes caught in Malian trap using the three baits (Tables 1 and 2) are diverse in shape, ecological riches and behavioural characteristics (Holden and Reed, 1972). They comprised the pelagic fishes such as Alestes and Tilapias and bottom dwellers such as *Labeo coubie*, *Clarias anguillaris*, the fishes also have diverse feeding habits, ranging from microphagus, larvae and insect feeders (Alestes and Synodontis), to omnivores Clarias and Chrysichthys, and suckers or mud feeders such as *Labeo* (Reed et al, 1967; Holden and Reed, 1972). The many species caught may be attributed to the baits as well as the traps themselves, since fish could also get into unbaited traps in the course of search for food.

The difference in the relative quantities of each type of fish caught in the Malian trap was due to the influence of the baits. The baits used in the present study were plant products, except the stomach contents that could be considered as animal product.

Comparisons of the results of the quantities of fish caught by baits in Malian trap (Table 3) appeared to undermine three apparent deductions. First, *O. niloticus* contributed greatest proportions of the overall number and biomass of fish caught in each of the bait types. This might probably be due to the effects of baits, trap efficiency or abundance of *O. niloticus* than other fish species in the Lake. The results of the study shows that baiting the trap particularly with stomach contents enhanced its efficiency for *L. coubie*, *T. zillii*, *Chrysichthys*, *Synodontis* and this could be explored for increased catch per unit effort and profit. Malian traps baited with corn and rice bran attracted more *O. niloticus* (by number and weight).

The baited traps appeared not to be quite size selective, as such they are capable of trapping and retaining small size fishes, and the juveniles and adults of large commercial fishes due to small size (1") of net covering the trap.

CONCLUSION

The three baits experimented in the present study had varied effects on the composition and quantities of fish caught in the Malian trap. Greater number and weight of *Labeo coubie* was attracted than other the other species caught in trap baited with stomach contents, the use of this bait would enhance the catch efficiency for *Labeo*, a highly rated commercial fish as well as *Tilapias* and *Distichodus*, thereby increasing catch per unit effort and profitability of fishing.

The use of corn bran and rice bran as bait is also recommended for the trap as a way of enhancing catch efficiency for fishes such as *O. niloticus*, *S. galilaeus*, *T. zillii* and *D. rostratus*.

The three baits experimented in this study were of different forms, texture, colour and odour. Investigations on the effect of these properties on composition of fish catch might provide a way of enhancing the efficiency of the trap.

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